

WHAT IS CLAIMED IS:

1. A manufacturing method of an endless metal belt having metal rings built up and differing in circumference, comprising the steps of:
 - 5 a first circumference correction step of expanding each of the metal rings; and
 - a second circumference correction step of expanding each of the metal rings after conducting a solution heat treatment to the expanded metal ring, wherein
 - 10 by executing the first circumference correction step and the second circumference correction step before and after the solution heat treatment, respectively, an expansion quantity for setting a circumference of each of the metal rings to become a predetermined length is attained.
- 15 2. The manufacturing method of an endless metal belt according to claim 1, wherein
 the expansion quantity attained in the first circumference correction step is corrected to correspond to the circumference set to each of the metal rings differing in circumference.
- 20 3. The manufacturing method of an endless metal belt according to claim 1, wherein
 the manufacturing method further comprises a rolling step of forming each of the metal rings input in the first circumference correction step by rolling.
- 25 4. The manufacturing method of an endless metal belt according to claim

1, wherein

each of the metal rings is input between a work roller and a tension roller in the rolling step;

5 a tension is applied to each of the metal rings by moving the tension roller in the rolling step;

each of the metal rings is rolled by moving a rolling roller to press the rolling roller against the metal ring in the rolling step;

the tension roller and the rolling roller are servo-controlled;

10 based on one of operation patterns of the tension roller and the rolling roller, the other operation pattern is changed.

5. The manufacturing method of an endless metal belt according to claim 1, wherein

15 the work roller and the rolling roller are set to have an equal circumferential speed.

6. The manufacturing method of an endless metal belt according to claim 1, wherein

20 each of the metal rings is input between the work roller and the tension roller in the first and the second circumference correction steps; and

each of the metal rings is expanded by moving the tension roller until the circumference of each of the metal rings becomes a set circumference in the first and the second circumference correction steps.

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7. The manufacturing method of an endless metal belt according to claim 1, further comprising the step of:

measuring the circumference of each of the metal rings before the second circumference correction step.

8. The manufacturing method of an endless metal belt according to claim 5, wherein

based on a moving length of the tension roller necessary to apply a predetermined tension to each of the metal rings input between the work roller and the tension roller, the circumference of each of the metal rings is measured, in the circumference measurement step; and

10 movement of the tension roller is controlled based on a combination of pressure control and position control.

9. A manufacturing apparatus of an endless metal belt having metal rings built up and differing in circumference, comprising:

15 a first circumference correction section expanding each of the metal rings; and

a second circumference correction section expanding each of the metal rings after conducting a solution heat treatment to the expanded metal ring, wherein

20 by using the first circumference correction section and the second circumference correction section before and after the solution heat treatment, respectively, an expansion quantity for setting a circumference of each of the metal rings to become a predetermined length is attained.

25 10. The manufacturing apparatus of an endless metal belt according to claim 9, wherein

the expansion quantity attained by the first circumference

correction section is corrected to correspond to the circumference set to each of the metal rings differing in circumferences.

11. The manufacturing apparatus of an endless metal belt according to
5 claim 9, further comprising:

rolling section forming each of the metal rings input to the first circumference correction section by rolling.

12. The manufacturing apparatus of an endless metal belt according to
10 claim 9, wherein

the rolling section applies a tension to each of the metal rings input between a work roller and a tension roller by moving the tension roller, and rolls each of the metal rings by moving the rolling roller to press the rolling roller against the metal ring;

15 the tension roller and the rolling roller are servo-controlled; and based on one of operation patterns of the tension roller and the rolling roller, the other operation pattern is changed.

13. The manufacturing apparatus of an endless metal belt according to
20 claim 9, wherein

the work roller and the rolling roller are set to have an equal circumferential speed.

14. The manufacturing apparatus of an endless metal belt according to
25 claim 9, wherein

the first circumference correction section and the second circumference correction section expand each of the metal rings input

between the work roller and the tension roller by moving the tension roller until the circumference of each of the metal rings becomes a set circumference; and

the tension roller is servo-controlled.

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15. The manufacturing apparatus of an endless metal belt according to claim 9, further comprising:

a circumference measurement section measuring the circumference of each of the metal rings.

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16. The manufacturing apparatus of an endless metal belt according to claim 9, wherein

the circumference measurement section measures the circumference of each of the metal rings input between the work roller and the tension roller based on a moving length of the tension roller necessary to apply a predetermined tension to each of the metal rings; and

movement of the tension roller is controlled based on a combination of pressure control and position control.

20 17. A manufacturing apparatus of an endless metal belt having metal rings built up and differing in circumference, comprising:

first circumference correction means for expanding each of the metal rings; and

second circumference correction means for expanding each of the metal rings after conducting a solution heat treatment to the expanded metal ring, wherein

by using the first circumference correction means and the second

circumference correction means before and after the solution heat treatment, respectively, an expansion quantity for setting a circumference of each of the metal rings to become a predetermined length is attained.